UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

First Notice – UIC
February 13, 2020

Richard Tremblay
Vice President Operations
Florence Copper, Inc.
1575 W. Hunt Highway
Florence, AZ 85132

RE: Underground Injection Control (UIC) Permit Application No. R9UIC-AZ3-FY19-1 Florence Copper Project, Florence Arizona

Dear Mr. Tremblay,

We received your Florence Copper Class III UIC Permit application on October 4, 2019 and on November 5, 2019 we sent you a letter indicating that your application is complete, as specified at Chapter 40 of the Code of Federal Regulations (40 CFR) §124.3(c). Nancy Rumrill of my staff has spoken to you by phone in weekly updates to discuss additional information needed to clarify, modify, and supplement the previously submitted material. We are unable to continue processing your permit application until we receive this additional information.

Specifically, the information as detailed in the Enclosure is necessary to clarify, modify, and supplement your previously submitted application material. Please submit the information requested by March 16, 2020. If you are unable to provide the information by March 16, 2020, you may withdraw your application until you have all the required information. Once you have all the necessary information, you may resubmit your full permit application at any time.

If, by March 16, 2020, we do not receive the additional information, and if you do not withdraw your application, EPA may initiate the process to deny your permit application. See 40 CFR §124.6. Please note that to ensure the protection of underground sources of drinking water, the Safe Drinking Water Act Section 1421 prohibits underground injection which is not authorized by rule or a permit issued by EPA or an authorized State. Safe Drinking Water Act, 42 U.S.C. 300h(b)(1)(A).

Please address all items noted in the Enclosure by submitting a response to the requested information and two copies of a complete revised and supplemented application in hard copy and in electronic format. Please submit the information requested to:

Attn: Nancy Rumrill
Water Division
U.S. EPA Region IX, (WTR-4-2)
75 Hawthorne Street
San Francisco, CA 94105

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Thank you for your attention to this matter. If you have any questions or wish to discuss further, please contact me at (415) 972-3971, or your staff may contact Nancy Rumrill at (415) 972-3293.

Sincerely,

David Albright
Manager, Groundwater Protection Section

Enclosure

cc: Maribeth Greenslade, ADEQ
Anita Thompkins, EPA Office of Groundwater and Drinking Water

ENCLOSURE

Request for Information on the
Florence Copper UIC Class III Permit Application
Dated October 4, 2019

Well Log Data and Testing Results

1. The Production Test Facility (PTF) wells were tested in accordance with the Arizona Department of Environmental Quality's Aquifer Protection Permit and the UIC Permit, but the PTF is a small area of the proposed in-situ copper recovery (ISCR) project area. Please provide a description in the application of additional pumping tests as wells are drilled and completed in the broader ISCR project area to confirm the PTF data and identify any variability across the project site.

2. Only one well (R-03) intersects a major fault zone. Please provide a description in the application of additional aquifer testing in or as close as possible to the fault zones.

3. Please explain why neutron logs were run without density logs. Please clarify whether the log-based porosity values were developed from compensated neutron-density logging or from just neutron logging.

Attachment A, Area of Review (AoR) Method

4. Regarding the step rate testing, starting on page 582 in Attachment B of the application, there are several pages of step rate test data where cells are populated with the #REF! Excel error code. Please provide the missing data in the application or explain why it is omitted.

5. Please tabulate and clarify how the 1995 aquifer testing data, the original model K values, and the PTF pump test data align. Please explain how discrepancies have been reconciled.

6. The K values in Table B-3 are annotated with data quality notes. In developing the original model parameters, identify any data points excluded from the 1995 aquifer testing data due to data quality as indicated in the notes.

7. Please confirm whether any changes were made to porosity for the model update. If so, please identify or highlight these changes in the application.

8. Please explain the locations and methods for collecting porosity data used to support the original model. Identify initial porosity data supporting the original model located within the PTF area.

9. Please tabulate and clarify in the application how the original porosity data, the original model values, and the newer log-based porosity values align. Please explain how any discrepancies have been reconciled.

10. Please provide a discussion in the application of the potential for the dissolution of ore mineral in the fractures to change formation permeability and porosity.

11. EPA will require that additional neutron logging porosity data be obtained and additional permeability data for the Middle Fine-Grained Unit (MFGU) be obtained as new wells are drilled in the project area. Please include this in the application.

12. EPA will require that you confirm K values in the fault zones during future aquifer tests via other wells that intersect the major fault zones. Please include a description of this in the application.

Model domain

13. Please provide in the application versions of Figures A4-A13 that contain a legend for the lower images with hydraulic conductivity values.

14. There is no map showing the boundary conditions. Please provide a map in the application showing the boundary conditions and explain if the entire northern, southern, and western boundaries are set as general head boundary cells.

15. Please confirm which values were assigned to each of the layers in Figures A-3 through A-13 and whether there is any lateral variation in the K values assigned (aside from the higher values for the major fault zones).

Model calibration

16. Please explain in the application what sensitivity analyses were performed to test the effects of uncertainties in model parameters, including K and porosity.

Simulations

17. Given the variability in the thickness of the Lower Basin Fill Unit (LBFU), please provide a discussion of the potential for vertical migration to reach the LBFU/MFGU contact.

18. Please provide a discussion of potential scenarios in which fluid migration during uncontrolled injection might be affected by operations in nearby injection and recovery wells.

19. The two main fault zones and numerous other smaller fault zones all generally trend NW/SE. Please provide a further discussion of the potential for preferential flow in the NW/SE direction (e.g., Figure 3 in the modeling update report).

Attachment B, Geological and Geophysical Information

Upper confinement

20. Please provide isopach and structure contour maps in the application that include the project site.

21. Please describe and provide any additional data on the permeability of the MFGU.

22. Please describe and provide any pumping test data and results for M56-LBF and the nearby M57-O (in the oxide zone). Please describe and provide any other data indicating hydrologic communication between the LBFU and the oxide units.

Lower confinement

23. Please provide any available detail on the permeability data for the sulfide zone as shown in Figure 16-3 of the 2017 report (NI 43-101 Technical Report: Florence Copper Project), including how the data were obtained, at which sites, and likely representativeness of the sulfide zone in general.

Attachment C, Well Construction/Conversion Information

24. Please provide a description of and the supporting Annular Conductivity Device (ACD) data available from the PTF wells to confirm whether fluid migration occurred.

25. Please provide a discussion of the use of a cement grouting shoe at the bottom of the casing to circulate cement in the annulus behind the casing versus the proposed tremie pipe down the casing annulus from the top method related to FCI's experience with construction of the PTF wells.

Corrective Action

26. Please provide a description in the application of how the depths to the key formation tops will be determined where the casing will be perforated.

27. Please provide the actual cementing record, if available, and depict the formation tops and perforated intervals on the plugging and abandonment well and corehole diagrams if the casing/wellbore annuli were not cemented when constructed.

Attachment D, Injection Operation and Monitoring Program

Groundwater monitoring

28. Please provide or reference details on planned closure and post-closure monitoring in the application, including timeframe, frequency, sampling parameters, and the locations of all wells to be sampled (e.g., POC, verification, any other monitoring wells).

Fluid stream composition

29. Please provide a discussion in the application of how the experimental runs relate to the duration of planned operations, including any extrapolation from the experimental work needed to guide operational and restoration plans.

30. Please provide a discussion in the application of what was learned from the PTF regarding the development of a mature pregnant leach solution (PLS).

Hydraulic control during the PTF

31. Please provide a description of whether data indicate any lapses in hydraulic control during PTF operations.

32. Please provide a discussion in the application of any differences between the PTF and the larger full-scale operation that could affect the ability to maintain hydraulic control during commercial operations.

Attachment E, Plugging and Abandonment Plan

33. In Section E.2.1, the following text excludes non-Class III wells and coreholes located within the AOR - "All abandonment notifications, approvals, procedures, documentation, and reporting required under this plan apply to all Class III wells constructed within the commercial-scale AOR, which includes the PTF wells and BHP test wells." Please explain those omissions or add them to the text.

34. In the following sentence on page E-3, please replace "PTF" with "ISCR:" "At the conclusion of PTF operations, proposed Class III wells within the AOR will remain open for use in monitoring groundwater conditions until ADEQ and USEPA give approval to plug and abandon the wells."

35. In the following language on page E-3, please clarify or correct the omission of observation wells and closure wells within the wellfield during post-closure monitoring: "Post-closure monitoring at the point of compliance (POC) wells and supplemental monitoring wells will continue following completion of formation rinsing for the period of time specified in the APP and the UIC Permit. The POC wells will remain open for the period of time necessary to complete closure and post-closure monitoring specified in the APP and the UIC Permit."

36. Section E.2.4 of the application on page E-3 states: "Not more than 2 years following the provisional closure of an ISCR well, the well will be abandoned in accordance with procedures outlined in this plan and requirements set forth in the UIC Permit and the APP". Please note that all ISCR wells should not be abandoned after "not more than 2 years". Post-closure monitoring will require retention of closure verification wells converted from ISCR wells within the wellfield for a period of at least five years. Additional rinsing may also be necessary if exceedances occur during post-closure monitoring. Please clarify.

Shaft abandonment

37. Please add a full description of the shaft abandonment procedures and/or reference the EPA 7520-19 form and well diagrams in the application.

38. Please clarify in the application the intent and procedures for removal of obstruction in the shafts and provide cost estimates for plugging and abandonment of the shafts.

Attachment F, Financial Assurance

39. Please provide a description and a draft financial instrument in the application for EPA's review. The instrument should meet the UIC requirements and the recommendations (e.g., in EPA's Class VI Financial Responsibility (FR) Guidance, Class II FR Guidance, and consistent with 40 CFR §144.52(a)(7) and 40 CFR Subpart F), and include a complete list of the wells, post-closure monitoring and restoration activities that will be covered by the instrument.